FEBRUARY 1998

PROMOTING EXCELLENCE IN THE TEACHING OF HUMAN ANATOMY & PHYSIOLOGY
HAPS-EDucator
FEBRUARY, 1998
Volume 2, No. 3

CONTENTS

From The Editor's Desk
Theresa W. Page

Greetings from Your President
Kevin Patton

Books On Review
The Phantom Reviewer

Exciting News About Members

Teaching Tips
An Electron Optical View of Cadaver Structure
Scott D. Hawke

Update Workshops
Gender Determination of the Skull
Robert L. Smoes
Interactive Computer Programs in Lieu of Cadavers in the Anatomy Laboratory
Alvin M. Burt

Update Symposium
Advances in Treatment of COPD and Asthma
Sheldon Mintz
The Role of Age and Gender in Cardiovascular Response to Oxygen Stress
Carin Wittnich

Input-Output
Using Multimedia in your Classroom Teaching
Jamie King

HAPS Committees

Cover design and graphics by Toby Rae Nelson of Nelson Graphics.
Hey, Pardner!
You need to get that registration form
in the mail TODAY.
We’re expecting you in Fort Worth!!

**Registration:** $165 (Feb. 1-April 30, 1998); $175 (after April 30, 1998).

**Hotel:** Radisson Plaza Hotel; 815 Main Street; Fort Worth, Texas 76102
   Reservations: (800) 333-3333
   WebPage: www.Radisson.Com/Ftworthtx
   Front Desk: (817) 870-2100; Fax: (817) 335-3408
   Room Rates: $85 single; $105 double

**Travel:** The nearest airport is Dallas-Fort Worth International Airport. It's approximately 20 miles (20-30 minutes) from the hotel. Shuttle transport to the hotel is $8.00.

**Official Airlines:** American Airlines is the official airlines for the conference. Reservations and ticketing can be arranged by calling (800) 433-1790. Be sure to refer to HAPS starfile number or AN number (3258UD) to get the appropriate discounts.

**Weather:** In May the average temperature ranges from a high of 84 to a low of 62, but temperatures in the 90's are not unusual. Heavy rainfall with frequent thunderstorms is typical. On the positive side, with our famous Texas wildflowers in full bloom, spring in the Fort Worth area can be an awesome experience.

**Conference Coordinator:**
Theresa W. Page
Texas Woman's University
Dept. of Biology
P.O. BOX 425799
Denton, TX 76204-5799
Phone: (940) 898-2398
Fax: (940) 898-2382
Email: F_Page@TWU.edu

**Exciting Workshop Proposals**

- **Mudy Veil & Carol Javanika:** Terrific tips for teaching tough topics.
- **Joel Michael:** Active learning—What is it and how do I promote it in my classroom?
- **Mary Gabbauer:** The defense does not rest. Pseudoagents.
- **Nataliel Mills:** Electrophoretic separation of DNA on agarose gels.
- **Plus many, many others...**

**SYMPOSIA TOPICS**

- Forensics: Dr. Ron Singer
- Fetal Alcohol Syndrome: Dr. James West
- Core Curriculum Issues: Dr. Dan Lemons and Dr. Joe Griswold
- Technology in Education: Dr. Robert Carroll (sponsored by APS)
- Bone density & Osteoporosis in Women: Dr. David Nichols
- Neurobiology: Dr. Guenter Gross
- Immunology: Dr. Bob Lanier (Keynote Speaker) who assisted in the care of David, "the boy in a bubble."
- Urinary System Physiology: Dr. Fred Leach
- Female Reproduction (endocrine focus): Dr. Debra Smith
- Sports Medicine: Dr. Michele Trankina
- Forensic Polygraph: Dr. Joel Reichert

**OTHER FUN-FILLED ACTIVITIES**

- Big D (Dallas) Tour
- Fort Worth Cultural Center
- Botanical Gardens and Zoo
- Six Flags Over Texas Theme Park
- Ranger Baseball
- Tarantula Train
- Fort Worth Stockyards Historic Area
- and Billy Bob's
- Sundance Square—Unique Shops and Restaurants
**HAPS-EDucator**

**Editor**
Theresa Whitfield Page

**Assistant Editors**
Craig Clifford
Richard Faircloth
Michael Glasgow
Gary Johnson
Virginia McDonald
Christine Martin
Charles McKinley
Colleen Nolan
Judith Osborn
Martha DePecol Sanner

**Editorial Advisory Board**
Annette Dawson
Henry Ruschin
Caryl Tickner
Donna Van Wynsberghe
Carolyn Baratta Yucha

**HAPS-EDucator** is the official publication of the Human Anatomy and Physiology Society (HAPS) and is published four times per year. Major goals of the Human Anatomy and Physiology Society are to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences, both regional and national, where members can obtain information about the latest developments in the health and science fields; and to encourage educational research and publication by HAPS members. HAPS was established in 1989.

Annual membership dues are $30. Annual membership renewals shall be due on January 1, April 1, July 1, or October 1. New members shall renew on whichever date most closely follows the date of their initial membership. HAPS Hotline: (800) 448-HAPS (4277). Information on membership, meetings and more! Send correspondence to: HAPS, 222 S. Meramec, Suite 303, St. Louis, MO 63105. Check out our new webpage at: http://www.bio.psu.edu/haps

**SUBMISSIONS TO HAPS-EDucator**
Papers for publication, requests for information, positions available and wanted and letters to the editor are welcomed. Articles submitted on 3.5" double density disks are preferred—please include a hard copy as a backup. If references are included, please follow the methods suggested in: *Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers*. 6th Edition, Style Manual Committee (Council of Biology Editors) Cambridge. Cambridge University Press. 1994.

It is the policy of the Human Anatomy and Physiology Society (HAPS) that any advertising appearing in its publication must be related to the teaching of anatomy and physiology. The HAPS Editor and Editorial Board jointly determine whether an advertisement meets the criteria of the Human Anatomy and Physiology Society. Any advertisement that is deemed not to meet the needs of the organization will not be printed, and the advertisement plus any monies collected from the advertiser will be returned. The opinions reflected in advertising that appears in its publication do not necessarily represent the opinions of the Human Anatomy and Physiology Society. Advertisement of a product in the *HAPS-EDucator* does not represent endorsement of that product by the Human Anatomy and Physiology Society. Contact the Editor for information on advertising rates, advertisement size and the procedures for submitting an advertisement to *HAPS-EDucator* for publication.

**DEADLINES FOR SUBMITTING MATERIAL TO HAPS-EDucator:** June 1 (August issue); September 1 (November issue); December 1 (February issue); March 1 (May issue).
This issue of the HAPS-EDucator, as with all our issues, is chock full of useful ideas for the busy anatomy and physiology instructor. Leading the way is Scott Hawke from Willamette University. Scott has developed a unique approach for introducing students to the concepts of histology. As is typical of HAPS members, Scott has offered to share his experiences with all of us in the Teaching Tips section.

Update Workshops this month feature Bob, “the skull man,” Smoes from Towson University and Alvin Burt from Vanderbilt University. Bob has presented his workshop on “Gender Determination of the Skull” at several past HAPS Conferences. It is very popular with Conference attendees. I have not yet had the privilege of participating in one of his workshops, primarily because there are so many outstanding workshops to choose from at each Conference, but I hope to do so soon. If you have missed the experience as well, this is an opportunity to discover what all the excitement is about and also have a preview of the workshop for the upcoming Conference in Fort Worth, Texas since Bob has agreed to do it “one more time.”

Alvin Burt is another of those friendly and dedicated HAPS members who has presented workshops at several of the past HAPS Conferences. Alvin’s Update Workshop is titled, “Interactive Computer Programs in Lieu of Cadavers in the Anatomy Laboratory.” The name of the workshop suggests that he is actively involved in updating his laboratories with the latest techniques using computers. Read his summary to learn more about this “hot topic in A&P.”

If technology is your latest interest, you should definitely read Jamie King’s article in the INPut/OUTput section. Jamie’s lively discussion includes helpful tips, as well as the pitfalls to avoid, on learning to use multimedia in the classroom. By the way if you are planning to attend the Annual Conference, don’t miss the afternoon (technology) sessions on Sunday, May 24, 1998 and Monday, May 25, 1998. Martha Sanner and John Waters, Co-Chairs of the Technology Committee, have had a major role this year in helping select technology speakers for the Conference.

Two other talented HAPS members volunteered to write summaries of the Update Symposia presented at the 1997 Conference in Toronto, Canada. Chuck McKinley, a member of the Editorial Board for the past two years, has very successfully provided us with the high points of the presentation by Dr. Sheldon Mintz. Patricia Bowne provides an equally impressive summary of the presentation by Dr. Carin Wittnich.

Steve Trautwein, HAPS President-Elect, is on a talent search for HAPS members who are interested in serving as elected or appointed officers. After reading his article, we hope you will volunteer for one of those positions.

SLICE OF LIFE & COMPUTERS IN HEALTHCARE EDUCATION SYMPOSIUM June 22-27, 1998 at the University of South Florida in Tampa, Florida

The symposium is for educators and multimedia developers and will cover CD-ROM, WWW, Audio, Video and other Multimedia with workshops and panel discussions.

Pre-registration (before April 30, 1998): US $295; late registration (after May 1, 1998): US $395. The registration fee includes lunches, coffee/tea breaks & hospitality suite. For more details, visit their website at: www.slice98.gsm.com

To register contact:
Noelle Beaumont
Office of Academic Computing
Thomas Jefferson University
1020 Walnut Street
Philadelphia, PA 19107
Phone: (215) 503-5523
Email: noelle.beaumont@mail.tju.edu

For information on the program, contact:
Suzanne Stensaas
Cornell University
Phone: (718) 746-6445 or (810) 581-8694
Email: stensaas@mail.med.cornell.edu
GREETINGS
FROM YOUR PRESIDENT

Kevin T. Patton, President

WOW! The year has really been hectic so far. There are many things happening in your organization right now, so I'll take this opportunity to bring you up to date on as many as I can.

First and foremost, the BIG project this year has been to shift our mode of operation to include professional management services. As I've already communicated to you, the professional associations management firm of Organization Services Group took over most of our administrative functions on September 1, 1997. As was expected, Tonya Ferguson (OSG) and her staff have spent many hours working with me, and other Board members, to develop new ways of doing business. We're still working on this, but I think we've made great strides.

Our database is now fully transferred and up and running at our new headquarters in OSG offices in St. Louis. Our books are still being audited and we should have everything smoothed out and on track soon. The auditors and OSG are working together to make sure we are in compliance with the many rules and regulations governing bookkeeping in nonprofit corporations as large as ours. Yes, we're pretty large now.

By the time you read this, the Board will have met for its annual midyear meeting. This year, the meeting was in St. Louis. Not only was this a good choice in terms of economy, but it also gave us the opportunity to meet at our new headquarters and talk face to face with our new staff. Unlike past midyear meetings which included the entire Steering Committee, this year’s midyear meeting included only Board members. This was done to reduce costs, wherever possible, until the books can be converted to the new system and we can produce a predictable budget.

At the January Board meeting, a number of items were planned for the agenda. Besides issues regarding the transition mentioned above, the Board was expected to consider the overall list of services provided to members. The HAPS mission of excellence in teaching human anatomy and physiology is our primary concern and we feel that the most important thing we can do as a Board is to make sure your organization is serving your needs. To help us with this, we are using the surveys that you have sent to us (or returned at the Toronto meeting).

We are also expected to review a plan to coordinate all of our publications so that you are served in the best way possible. If any of you would like to help in our large publications effort, please contact me or Theresa Page, our Publications Editor. We really do need your input and feedback—and what a great way to share your expertise with your colleagues!

Another of the areas where HAPS has been of greatest service to members has been in the area of meetings. Our next Annual Conference in Fort Worth promises to keep up the HAPS tradition by being “the best meeting ever.” Theresa Page and her colleagues in Texas are working hard and I, for one, can hardly wait to get there. If you’ve never been to a national meeting, this would be a great one to start with. But I warn you! They are addictive. The friendly, casual atmosphere combined with dynamite content and contacts, make HAPS meetings one of the best teaching resources around. You’ll not be satisfied with just one!

An area of increasing service to our members is that of local conferences. Ann Smith and her committee tell us that there are several coming up this year that promise to carry the HAPS tradition to more and more local areas around North America. Watch your mail for information on meetings near you! If you are interested in hosting a local meeting—a great experience in itself—don’t hesitate to contact Ann. Or if you’re up to an even more exciting challenge, contact Shirley Mulcahy about hosting a national meeting. Ann and Shirley will guide you through the whole process and plug you into the extensive network of support within HAPS.

It looks like the HAPS bug is catching on elsewhere in the world. On several recent trips to Australia and New Zealand,
Ric Martini spread the good word about our organization to our colleagues “down under.” They’re responded positively and it looks like they’ll be joining our worldwide network of A & P teachers. Ric has kindly agreed to act as HAPS Ambassador to the Pacific by helping facilitate communications between North American and Pacific members.

Have a GREAT spring semester (or quarter or whatever)! As always, I’m looking forward to hearing from you if you need anything—or just want to chat. See y’all in Fort Worth!

Kevin.

---------------------

**CALL FOR PROPOSALS**

**HAPS GRANTS AND SCHOLARSHIPS PROGRAM**

Do you have a Human Anatomy and/or Physiology “project” that has been kept on the back-burner because of lack of financial support? Funding may be on its way! Teachers and students of anatomy and physiology are equally invited to apply for a HAPS grant or scholarship. For application forms contact:

Estry Z. Ang
University of Pittsburgh at Greensburg
1150 Mt. Pleasant Rd.
Greensburg, PA. 15601
Email: Estry@vms.cis.pitt.edu
Fax: (412) 836-7129

**ROBERT ANTHONY SCHOLARSHIP FUNDS SOUGHT**

On behalf of Bob Anthony, the Board of Directors and the Steering Committee Members invite you to support the anatomy and physiology education of your novice colleagues by making contributions to the Robert Anthony Scholarship Fund. In making a donation, you will honor this special man and help the next generation of anatomy and physiology faculty.

When the scholarship was founded, Bob was given the latitude to determine how contributions would be spent. As is so typical of him, Bob wants to encourage fledgling faculty who teach anatomy or physiology. Thus, these funds will be earmarked to provide scholarships for new HAPS members to encourage participation in the annual conferences. Initially the scholarships will pay for registration, but as the scholarship fund grows it will be used to pay for lodging. Estry Ang, Chair of the HAPS Grants and Scholarship Committee, is assisting Bob in working out the final details.

As announced at the 1997 Annual Conference, the Robert Anthony Scholarship Fund was established to honor the contributions of our “founding father,” Bob Anthony, a man whose leadership resulted in this organization. Bob provided the original spark for formal organization of HAPS, gave steady encouragement and guidance to the fledgling group, nurtured members and officers and served as President (1995-1996). Bob and his wife, Mary Ann, even opened their home for mid-year board meetings, graciously housing, feeding and hosting some two dozen officers for several days.

Please join us in making contribution to this scholarship fund. Your donations will be fully tax-deductible since HAPS is a non profit organization. Please write a generous check to the HAPS Robert Anthony Scholarship and mail it to:

John Martin
HAPS Treasurer
Clark Community College
1800 E. McLoughlin Blvd.
Vancouver, WA 98663
(360) 992-2282
jmartin@edu.com

THANK YOU!

For honoring Bob and helping future instructors.
WANTED!!

HAPS members willing to make at least
50 new friends in six months
by
hosting a one-day
LOCAL
CONFERENCE

*** The Local Conference Committee has ***
materials to help you plan and run a
conference!

Please contact:
Ann M. Smith
Joliet Junior College
1215 Houbolt Rd.
Joliet, IL 60431
(815) 729-9020 X 2373

BOOKS ON REVIEW

"The Way We Never Were: American Families and the Nostalgia Trap" is a fascinating book by Stephanie Coontz (BasicBooks, 1992). Although political leaders in both major political parties would have us believe that they, and only they, can accurately define a family, the concept is actually quite old. In its original form, the word "family" simply referred to a band of slaves. The association of love with family, as in "loved ones," in historical terms is quite recent, coming into use sometime after 1900. The meaning of family has therefore changed over time just as the role of the family within our society has changed over time.

Conservatives define the traditional family along gender

Continued on page 13

ABOUT HAPS MEMBERS

Two HAPS members, Terry Favaro and Christine A. Martin, have been named Teacher of the Year in their respective states. Terry Favaro, Assistant Professor of Biology, at the University of Portland in Portland, Oregon, was named Oregon Professor of the Year by the prestigious Carnegie Foundation. Some of you may recall the innovative workshop that Terry presented at the 1996 HAPS conference in Portland, Oregon. The Oregonian (Friday, October 24, 1997) contains an article on Terry. The following excerpts are from that article. According to Terry Favaro, "his job isn't just teaching in classrooms, it's education." One of the more amusing anecdotes involves a story about the time a cockroach crawled into his ear. Terry uses the story to illustrate points about the anatomy of the inner ear. Terry Favaro's teaching excellence and concern for his students is described by the experience of a struggling student who had flunked every test in his course, scoring in the low 30's and 40's. Terry tutored her intensively before the final exam. Not only did she pass the final exam in the top half of the class, she also made a passing grade in the course.

Christine Martin, Stark State College in Canton, Ohio, is a well-known and respected HAPS member who recently submitted an article on teaching excellence in the HAPS-Ed (May, 1997). In her article, Christine discusses common concerns that all of us have in teaching.

Congratulations to both these individuals for their outstanding accomplishments!

HAPS-EDucator February 1998 page 4
AN ELECTRON OPTICAL VIEW OF CADAVER STRUCTURE

Scott D. Hawke
Willamette University
Salem, OR 97301-3931

All exercise science majors at Willamette University take separate semester courses in Human Anatomy and Human Physiology. The anatomy class is a prerequisite for physiology. Both classes are ordinarily taken during the sophomore year. To help students link the study of anatomy from their previous semester with an understanding of the role biological design has in dictating function, I have begun incorporating electron microscopy into their physiology course. In my experience, students are successfully applying their enhanced understanding of the three-dimensional perception of the body to other courses.

Exercise science students study human anatomy on a cadaver provided by the medical facility of the University of Oregon. Understanding of body structure is strictly based on what they see in three dimensions without optical aids. They study body features only at the organ level of organization, or what is commonly called gross anatomy.

What the students do not perceive clearly in gross anatomy is body structure at the tissue and cellular levels of organization. To assist students in "seeing" the intact body from a more detailed view, it is advantageous to use a scanning electron microscope (SEM). Although its application with high magnification (100,000X) and resolution (4nm) is somewhat unusual for cadaver study, the benefits are well worth the resources dedicated to it.

I use SEM in my research and in a course that I teach on electron microscopy. The technology is relatively easy to use since it is software driven (Windows format) and involves only the familiar routine of point and click to activate the microscope's control functions. I decided to have my physiology students include this technology as a component of their laboratory experience in physiology. Although exposure to SEM would be better suited to their previous cadaver study in anatomy, the exercise science department, where the anatomy course is taught, does not have the faculty expertise to utilize this form of microscopy.

I had the students select a variety of tissue samples from the embalmed cadaver. These ranged from skeletal muscle, cardiac and liver to bone, hair and fingernail. The soft tissues were critical-point dried in CO2 to minimize shrinkage artifacts. Hard tissues were cleaned with alcohol to remove extraneous debris. Both types of tissue samples were sputter coated with a 200–300A layer of gold to make them conductive, and they were then viewed with a Philips XL–20 SEM. Students documented their findings by taking photographs with an attached video graphic printer. The cost of prints was nominal (pennies per exposure). Structures of interest in these photographs were then identified, measured, and appropriately labelled. The labelled photographs were included as part of the Results Section of their laboratory write-up. Recognition of what they observed was aided by making available in the laboratory several electron microscopy books. In the interpretation section of the laboratory write-up, students were asked to link anatomical features to their function in the body. Anatomy and physiology texts were consulted by the students in performing this exercise.

The students thoroughly enjoyed their SEM experience and in their lexicon they said, "It was cool." A number of the students indicated an interest in using SEM as a problem-solving tool in their senior research. This would be unprecedented for majors in exercise science. I have learned not to underestimate students' enthusiasm for a technology that is not common to their anatomy laboratory experience.

AMERICAN SOCIETY FOR MICROBIOLOGY
CONFERENCE
MAY 15-17, 1998
AT
EMORY UNIVERSITY
Frontiers in Microbiology Education
Curriculum Resources
Content Enrichment
Instructional Technology
For information on the conference as well as a variety of training and research programs available from ASM, visit their website at:
http://www.asmusa.org/edusr/eedu.htm
or contact:
Iris Kassem
Office of Education and Training
American Society for Microbiology
1325 Massachusetts Ave.
Washington, DC 20005-4171
Phone: (202) 942-9282
Email: EducationResources@asmusa.org

HAPS-EDucator February 1998 page 5
GENDER DETERMINATION OF THE SKULL

Robert L. Smoes
Towson University
Towson, MD 21252-0001

Students almost invariably ask about the gender of the skeletons used for teaching, and most anatomy and physiology textbooks provide some information about gender differences in the pelvis. A lesser known, but equally good, site for gender determination is the skull. Not only is the skull nearly as sexually dimorphic as the pelvis, it also fascinates it usually forms a bell-shaped curve. However, if the trait is sexually dimorphic, such a distribution is typically described by a graph with two skewed curves that may overlap considerably.

Determining the presence of specific traits by performing "eyeball" measurements can provide an adequate basis for determining the gender of a skull. When "eyeballing" a trait, one may find that it fits one statistical curve better than the other. Bob warned participants that measurements taken on a teaching skeleton represent one individual, not a population, and those measurements may fall anywhere on the population curve, although they are more likely to fall close to the mean. In addition, measurements on one individual could overlap regions, thus being equally likely to be of either gender. Non-gender factors, such as ethnic group and race, that could confuse analysis of a trait were also discussed.

A "hands-on" opportunity was provided to workshop par-

Two participants examine the gender features on human skulls.

the students when you respond to their questions about gender by examining the skull rather than the pelvis.

Bob, "the Skull Man," briefly discussed forensic osteology in his workshop, including the use of detailed, multiple measurements with complex statistical analyses, but commented that such a detailed analysis of the skull is inappropriate for the typical anatomy and physiology class. In the workshop he focused most of his attention on the normal distribution of a trait within a population. When a normal trait is graphed,

A group of participants follow Bob's instructions on how to determine the gender of those skulls.
ticipants (See Photographs). Bob brought about 20 skulls from Towson University's teaching collection to the workshop. Sexually dimorphic traits were first identified and discussed by the group, followed by analyzing and scoring each skull.

Evaluation was spirited with lots of interaction such as: "Is this a big ridge or a medium-sized ridge?", "Is this forehead more curved or more flat?" or "How did you get that, our score indicates that it is moderately male?" Time ran out before participants could analyze all the skulls, but as they were departing, the presenter overheard comments such as: "Just wait until the next student asks me about the sex of a skeleton!"

INTERACTIVE COMPUTER PROGRAMS IN LIEU OF CADavers IN THE ANATOMY LABORATORY

Alvin M. Burt, Ph.D.
Vanderbilt University
Nashville, Tennessee 37240-0008

At Vanderbilt University, cadavers in the anatomy laboratory have been completely replaced with interactive, computer-based programs. In his presentation, Dr. Burt described Vanderbilt's current anatomy and physiology program, discussed future plans for the computer-based laboratory and addressed the problems inherent in assessing its effectiveness.

Dr. Burt is presently using A.D.A.M. as the core for the computer-based anatomy and physiology laboratory. Since students need a navigation guide for their laboratory assignments, both a workbook and extensive supplemental directions are provided. As the students work through the exercises, they are expected to correlate the A.D.A.M. images with drawings and photographs from an atlas. For each laboratory exercise, the A.D.A.M. "dissection" is supplemented with a specific tutorial. The tutorials, which Dr. Burt created, use a combination of A.D.A.M. graphics, digitized photomicrographs, Visible Human material, and QuickTime movies. Tutorials are constructed in Microsoft PowerPoint format and accessed from the A.D.A.M. bookshelf via a PowerPoint Viewer. All of the labs are supplemented with the Interactive Physiology series of CD-ROMs (A.D.A.M. Software and Benjamin/Cummings). Laboratory exams are also taken on line, using a medium similar to that of the laboratory tutorials.

Vanderbilt has the hardware necessary to deliver this type of laboratory experience. All of the supplemental tutorial materials are contained on a server dedicated to the anatomy and physiology course. A.D.A.M. and the Interactive Physiology CDs are accessed from the same server with CD-QuickShare. This allows students to access the materials either directly through the 14-station Instructional Media Center or via any other computer site in the School of Nursing linked to their Local Access Network (LAN).

The computers in the dormitory rooms and at other sites on campus can access this server through ResNet, a fast ethernet network tied to the Vanderbilt ATM backbone. These connections provide the students with access to the materials 24 hours a day, 7 days a week. Novell Netware programs assure security of the site and control the number of students accessing the program moment by moment.

Students living off campus can access all of the tutorial materials through the course Homepage on the Internet. A.D.A.M. is not yet suited for cyberspace, but students can download zipped versions of all the tutorials in either a Mac or PC format. In addition to providing off campus access, the Internet provides Dr. Burt with an avenue for anonymous feedback from all of his students. Students are encouraged to ask questions about the content of a lecture that may have been confusing. This gives him an opportunity to review that segment again during the next lecture.

In the future, Dr. Burt plans to upgrade to the A.D.A.M. Interactive Anatomy (A.I.A.). This, however, will require a complete revision of his laboratory instructions. Dr. Burt believes that the Internet will be the avenue for student access to the materials in the future. His projections for the future include having the entire laboratory experience accessible via the Internet. He plans to convert all of the tutorial materials to an HTML format and place them on the website for the anatomy and physiology course. This will provide a more secure medium for materials that are protected by copyright. Additionally, it will allow students, both on and off campus, to view the materials. Upon installation of the VIVI Active 2.0 software program (to provide real time video streaming) and a Citrix Winframe Server, direct access via the Internet will become available to students. It will also permit student access to all CD's.

The most difficult question to answer is, "How effective is this type of laboratory experience compared with the more traditional laboratory?" Anatomy and physiology is a required course for admission to Vanderbilt's graduate program in Nursing. The course provides the knowledge students must have if they are to perform physical examinations and health assessments successfully and if they are to understand, diagnose and treat pathological conditions in the patient. Of the 450 students in Vanderbilt's graduate nursing program, 10 to 15% have taken Dr. Burt's anatomy and physiology course. The remaining students completed their anatomy and physiology requirements at other institutions. Some students learned anatomy using cadavers

Continued on page 12
ADVANCES IN THE TREATMENT OF COPD AND ASTHMA

Sheldon Mintz, M.D.
Woman's College Hospital
Toronto, Ontario, Canada M5S 1B2

Dr. Mintz began his presentation by informing the audience that there are more asthmatics in the world than there are diabetics since 10-20% of the population has some degree of asthma. Although the medical profession defines asthma as an inflammatory disease, Dr. Mintz admitted that no one knows exactly what asthma is. Chronic obstructive pulmonary disease (COPD) on the other hand is a disease that destroys lung tissue. This disease occurs as a mixture of overlapping conditions, including those of asthma, chronic bronchitis and emphysema. Together, asthma and COPD afflict a significant portion of the population. Both diseases have been linked to a deterioration in the overall quality of the air we breathe.

Asthma is variable; it may present with only a cough or with wheezing and dyspnea. A definitive diagnosis of asthma is difficult since there is no absolutely specific diagnostic test for the disease. Due to fundamental changes that occur in the lungs during the course of the disease, the long term effects of asthma may not be reversible. Altered pulmonary function is thought to occur when one or more mediators produce a cascade effect that ultimately brings about irreversible lung damage. The initial breathing difficulty appears related to activation of & receptors that induce bronchospasm and a reduction in airway size. With increased airway resistance, a reduction in air flow rate occurs, and the resulting ventilation-perfusion imbalance leads to hypoxemia.

While asthma may be a “multifactorial” disease, inflammation continues to be the long-term player. Changes in lung tissue occur when a foreign antigen(s) activates immuno-

competent cells in the airways. While several cell types are known to be involved in the disease, an initiator in the onset of symptoms is the pulmonary dendritic cell that begins the immune process by presenting antigens to immune cells.

Lymphocyte TH2 cells are also important in asthma since they secrete interleukins that bring about an activation of macrophages. Alveolar macrophages continue the immune response and the production of interleukin. Mast cells, while few in number in the normal lung, are seen in large number in the asthmatic lung. These cells release a number of substances including histamine that are responsible for inflammatory processes such as vasodilation and edema.

EMPHYSEMA
CHRONIC BRONCHITIS
ASTHMA

With the release of immunoglobulin E, other mediators are brought into play. Among these are prostaglandins, LTD4, TNF and IL4-6 which are thought to increase the severity of the asthma. Cytokines are important in this scheme although their mechanism of action is poorly understood. Eosinophils are present in large numbers and release enzymes to inactivate histamine and leukotrienes. Add to this alphabet soup the potential for a neurogenic inflammatory component, and the picture becomes even more confusing.

There are numerous cellular interactions in asthma, and any one of these could be triggered by an antigen or by a non-
specify stimuluses. Once activated they in turn bring about changes in the airway epithelium that compromise its integrity. Chronic asthma at the cellular level shows the following:

1. smooth muscle constriction in the airways.
2. edema of the airways.
3. shedding of epithelium.
4. alteration of the basement membrane.
5. increased production of mucus.

In an attempt to diagnose asthma, the physician often begins with the administration of an aerosol bronchodilator to the patient. The results should show an improvement of 12% in the patient’s FEV₁₀ value. After diagnosis, the physician usually starts with β₂ agonists and inhaled steroids to yield the best overall improvement in pulmonary function and symptoms. Typically, inhaled steroids take a week or longer to show results. If β₂ inhalers are prescribed, they should only be required 2 to 3 times per week. Any other medications are titrated to maintain good control with minimum use of steroids and β₂ agonists. Should control be lost, oral steroids are recommended to restore control. Indeed, Dr. Mintz explained that every visit to the physician’s office was basically a “therapeutic trial”.

Self-monitoring in asthma is as important as glucose-monitoring in the diabetic patient. Rather than measuring glucose levels in the blood, the asthma patient measures peak expiratory flow rates and monitors symptom levels. These two criteria should be tied to an action plan involving the doctor and the patient. Further attention should be paid to environmental components such that the patient’s exposure to second-hand smoke is reduced, physical activity is restricted when an air pollution alert is present and aeroallergens such as mites, cockroaches and pets are identified and removed. When an exacerbation of symptoms occurs, increased use of inhaled steroids at 2 to 4 times the normal dose is initiated. Should this not effect a reduction in symptoms, oral steroids are recommended at the level of 0.5 - 1.0 mg/kg/day for a two week period with a tapering of the dose toward the end of treatment.

Theophylline is no longer considered of value in the initial therapy for asthma, but much interest is currently being paid to other long acting β agonists. Serevent (salmeterol) is currently available and Formoterol is soon to be approved. Each of these drugs shows some advantages in bringing about immediate bronchodilation in the patient. The exact role of these drugs (and theophylline) remains to be determined.

Current problems in the treatment of asthma suggest the need for better delivery systems for inhaled drugs. This is particularly important since present inhalers use freon gas which is being removed from the market. A second problem in drug delivery arises because patients do not use inhalers.

---

Membership Form and Interest Survey
HUMAN ANATOMY & PHYSIOLOGY SOCIETY
222 South Meramec, Suite 303
St. Louis, MO 63105

Name

Last Name

First Name

Middle Name or Initial

Preferred Title (Dr., Ms., Mr., Mrs.)

Institution Name

Department or Division

Mailing/Directory Address (home or office)

City ___________________________ State/Prov. __________ Zip/Postal Code __________ Country

Phone ___________________________ Fax ___________________________ Email ___________________________

Your membership includes a subscription to HAPS-Educator ($10), the official HAPS publication. Please check (✓) if you are interested in or have experience in any of these areas:

✓ Dissection/animal use
✓ Use of Cadavers
✓ Electronics in the lab
✓ Lecture testing methods
✓ Lab testing methods
✓ Management/administrative
✓ Implementing computers in the classroom
✓ Radioisotope/special chemicals in the lab
✓ Disabled/Learning or disabled learners
✓ Physical facilities design
✓ Museum displays
✓ Grants
✓ Leadership skills
✓ Computerized library searches
✓ Computerized data acquisitions
✓ Videomage acquisitions
✓ Instructor/course evaluation
✓ Gradebook programs
✓ Team teaching
✓ Writing articles/textbooks/ manuals
✓ Lab safety

Complete this form, enclose a check for $30 (US) made payable to HAPS and mail to:

HAPS
222 South Meramec, Suite 303
St. Louis, MO 63105
correctly. With incorrect use, the actual dose delivered to the patient’s lungs is only 10-20% of the ejected amount. Dr. Mintz suggested that a spacer be used with the inhaler to increase the delivered dose. Additionally, the use of a dry powder without a filler would allow more accurate drug delivery. For mild to moderate asthma, an LTD4 antagonist is often prescribed. It is taken only once daily and appears to have few side effects.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Chronic obstructive pulmonary disease (COPD) is a disease that destroys lung tissue. This disease occurs as a mixture of overlapping conditions, including those of asthma, chronic bronchitis and emphysema.

With the continued destruction of alveolar tissue, only oxygen therapy can increase the longevity of COPD patients. As chronic pO2 levels drop below 50 mmHg, oxygen use is recommended. If hypoxemia increases, complications include polycythemia, pulmonary hypertension and cor pulmonale. In one study certain inhaled steroids were used in an attempt to improve airway function, but the results were suspect. Atrovent, an anticholinergic, acts as a bronchodilator and is considered more effective in initiating bronchodilation in these patients than adrenergics.

When chronic bronchitis occurs with purulent sputum, dyspnea or fever, certain microorganisms are suspected; these include H. pneumococcus, H. influenzae, and M. catarrhalis. It then becomes necessary to use one or more antibiotics. Current choices include: co-trimoxazole, clarithromycin, azithromycin and amoxicillin.

Rehabilitation of the patient includes an exercise program along with education and psychological support to improve the quality of life. This approach appears to reduce the frequency of hospitalization. Some success has been attained through surgical reduction of lung volume in the COPD patient. The effect of this technique is to let the remaining lung tissue expand, and in doing so, open up the remaining airways. Improvement occurs through reducing some of the effort in breathing, hyperinflation and dyspnea. This is difficult surgery at best, and large trials have not been done to date to determine its efficacy. It is not certain whether improvement continues in these patients. One report indicates no significant difference in the long term outcome between patients who receive surgical intervention and those placed in a rehabilitation program.

In summary, asthma and chronic obstructive pulmonary disease are two respiratory problems that appear to be increasing in number and severity. Their increase is probably linked to the general decrease in the quality of air as well as an increase in the number of people who smoke. Effective treatments for asthma and chronic obstructive pulmonary disease are based on a multifactorial approach with new drugs currently being tested. The long term outcome for these two disorders is uncertain as more and more of the population are afflicted.

Reported by:
Charles J. McKinley
Albany College of Pharmacy
Albany, NY. 12208
UPDATE SYMPOSIUM
THE ROLE OF AGE AND GENDER IN CARDIOVASCULAR RESPONSE TO OXYGEN STRESS

Presented by
Carin Wittnich, DVM., MSc.
Department of Surgery & Physiology
University of Toronto
Toronto, Ontario, Canada M5S 1A8

The majority of Dr. Wittnich's presentation dealt with cardiovascular problems in neonates and her laboratory's ongoing effort to discover why neonates suffer more complications after open-heart surgery than do adults or older children. She presented not only the research results, but an explanation of how these cases provided learning opportunities for the students working in her lab.

The operation and the support required to keep a neonate oxygenated during open-heart surgery were the first learning opportunities discussed by Dr. Wittnich. Understanding how the heart-lung machine functions, in particular, requires students to apply both qualitative and quantitative knowledge of the cardiac and pulmonary systems. Dr. Wittnich's lab students have the benefit of hands-on experience with the heart-lung machine, but students in any physiology course could use that knowledge to help them understand the basic principles involved in neonatal care. The use of a high K+ cardioplegic solution and hypothermia to relax the neonatal heart during surgery also have physiological consequences about which undergraduate students should be able to hypothesize.

Dr. Wittnich's research interests lie principally in exploring the differences between the neonatal circulatory system and that of older children or adults. A second interest is to gain an understanding of why a newborn heart enters rigor mortis after a shorter period of ischemia than does the adult heart. Dr. Wittnich provided several hypotheses, all based on knowledge about the adult heart. The adult heart, for example, uses aerobic catabolism of free fatty acids for approximately 65% of its metabolism. Does a neonate use fats to this extent, or does it depend on another substrate? Does a neonate accumulate more H+ during ischemia, and if so, why? Are there differences in the cell buffering systems? These are the kinds of critical questions students could be encouraged to generate after their first classes in cardiac muscle metabolism.

Dr. Wittnich presented data indicating that the neonatal buffering system is indeed different, probably due to lower intracellular levels of histidine. During ischemia, the neonatal cardiac cells accumulate H+ faster than do adult cells, and use less glycogen (Wittnich et al., 1987), probably because the high H+ levels inhibit phosphofructokinase. These effects were ameliorated, and ischemia tolerance increased, by perfusion with a substrate-free Krebs crystalloid solution. Such data could be used by students to evaluate their initial hypotheses about the problem.

Another question which could add to students' knowledge of the heart is whether neonatal hearts are affected differently by the alterations in extracellular Ca\(^{2+}\) levels. Neonates are generally thought to depend more on extracellular Ca\(^{2+}\). Dr. Wittnich presented data that suggests that neonatal metabolism is indeed more affected by changes in extracellular Ca\(^{2+}\) with increased injury in the presence of high Ca\(^{2+}\). However, pre-treatment with L-type channel blockers prevented this increase and resistance to ischemic damage in neonate hearts. This type of research provides excellent opportunities to remind students of the many types of ion channels, differences between the effects of extracellular and intracellular Ca\(^{2+}\), and the importance of different kinds of blockers, all concepts which students find difficult to grasp.

Some 30-40% of neonates who enter surgery are cyanotic, and Dr. Wittnich discussed the effects of hypoxia (Wittnich and Torrance, 1994). Severe hypoxia increases the levels of lactate, and since circulation continues, the washout of lactate is also increased—a point which students often find difficult to comprehend. As a result of the increased washout, moderate hypoxia does not cause the decreased glycolysis and decreased ATP usually found in ischemia. Neonates, however, do not use Creatine Phosphate (CP) as effectively to maintain ATP levels or buffer H+ as do adults. This is probably due to immaturity in the enzyme system that shuttles CP. Hearts with lower ATP levels have been shown to be less tolerant of hypothermia (Wittnich et al., 1991); therefore, hypothermia and hypoxia may be working together to adversely affect neonatal heart surgery patients.

Hypoxia also causes tachycardia and a biphasic change in blood pressure. Systolic blood pressure, mean arterial pressure, and pulse pressure first rise and then fall (Torrance and Wittnich, 1996). Undergraduates should be able to relate the tachycardia and blood pressure changes to the problems caused by hypoxia.

If hypoxia is detrimental, are excessively high oxygen levels protective? Dr. Wittnich pointed out that bypass patients may be exposed to oxygen levels as high as 290-466 mm Hg for several hours while on a heart-lung machine. Postsurgical patients are often maintained at elevated oxygen levels (70-438 mm Hg) for several days. This exposure is assumed to be benign or even beneficial in adults as well as children, but Dr. Wittnich presented data showing that severe hyperoxia is associated with increased blood glucose levels and with mild hyperoxia in the presence of decreased blood pressure. She emphasized the importance of leading students
to challenge accepted doctrine in physiology.

Dr. Wittnich presented some epidemiological and physiological research on differences between male and female cardiac patients, particularly the protective role of estrogen, which may help protect the heart by stimulating glycolysis. She outlined differences between male and female rats in baseline glycogen levels and elevation of fasting free fatty acid (Wittnich and Waller, 1997), suggesting a relationship between higher free fatty acids and a poorer prognosis in female heart attack victims.

Dr. Wittnich's presentation was fascinating not only for its subject matter but for the seamless way in which she moved from basic physiology through hypothesis formation and testing. Her presentation demonstrated the way in which neonatology can be used to lead students to understand as well as question the facts they have learned in class. I was particularly interested in the graphs Dr. Wittnich used in displaying her data, since students frequently have difficulty in interpreting and constructing graphs. After hearing Dr. Wittnich's talk, it was very easy to imagine a class sequence in which students would learn a topic in adult physiology, develop hypotheses to explain differences in neonates and interpret graphs from journal articles in order to evaluate their own hypotheses.

Reported by
Patricia S. Bouwe
Alverno College
Milwaukee, WI 53234-3922

References:


WORKSHOP UPDATE
Continued from page 7

while others used animal dissection.

Dr. Burt is undertaking a study to determine the effectiveness of the computer-based laboratory. All students who have taken anatomy and physiology within 4 years will be placed in one of four groups: (1) those from Dr. Burt's course, (2) those who used cadavers, (3) those who used animal dissections and, if there are sufficient numbers, (4) those who used A.D.A.M. to supplement dissections. Performance data from three advanced courses that rely heavily on the application of anatomy and physiology knowledge will be used to measure the effectiveness of the training. Three variables, Graduate Record Exam scores, grades in the anatomy and physiology course, and undergraduate grade point average, will be assessed in an attempt to define more clearly the impact of an interactive anatomy and physiology laboratory on the learning process and on the development of an applicable knowledge base.

In Dr. Burt's estimation, the most important learning goal is the students' ability to apply knowledge gained from the anatomy and physiology course to new situations. His hypothesis is that students who use interactive computer programs in their anatomy and physiology course are more likely to retain and apply that knowledge in their advanced courses than students who have not had the A.D.A.M. experience.

Dr. Burt is Professor of Cell Biology in Nursing at Vanderbilt University. For additional information on this topic, contact him via email at: alvin.burt@mcmail.vanderbilt.edu

Posing for a photo in front of the Toronto Colony Hotel at the 1997 Conference are (left to right): Mike Glasgow, Henry Ruschin, Bill Brothers, Martha Sanner and Donald Kisiel.
The Department of Biology invites applications for a full-time faculty position beginning in August, 1998.

Candidates must have at least an M.S. in the biological sciences and experience or training in human anatomy and physiology. The primary teaching responsibilities will be lecture and laboratory sessions of human anatomy and physiology courses to nursing, science education and health exercise science students. Experience with the use of human cadavers in teaching human anatomy is desired. Other teaching opportunities may include introductory biology laboratories. In addition to teaching a 12 hour load per semester, faculty members advise students, direct undergraduate student research, share in committee assignments, and are encouraged to conduct research. Opportunities for faculty development and research are available. Salary is commensurate with qualifications and experience. A comprehensive benefit package is available that includes undergraduate tuition benefits for dependents.

Oral Roberts University is a private liberal arts university located in Tulsa, Oklahoma, that operates in an evangelical Christian environment. For over 25 years the Biology Department has successfully trained students for professions in medicine, science teaching, and biological research.

Inquiries should be directed to:
Dr. Hal C. Reed, Ph.D.
Chair, Biology Department
Oral Roberts University
Tulsa, OK 74171
Phone: (918) 495-6930
Fax: (918) 495-6297
Email: halreed@oru.edu

Oral Roberts University employs, advances, admits, and treats in its employment and educational programs all persons without regard to race, sex, color, age, national origin, disability, or status as a veteran.

The Department of Biological Sciences, Bridgewater State College, Bridgewater, Massachusetts, invites applications for a full-time, tenure-track position beginning Fall, 1998. The position requires teaching animal physiology, human anatomy and physiology, introductory biology, and upper level courses appropriate for the department's biomedical concentration. The successful candidate must have an earned Ph.D. and a strong commitment to teaching and research in an undergraduate setting, as well as to advising undergraduate students in the biomedical concentration, and supervising original undergraduate research. Participation in equipment procurement is required. Teaching experience is preferred. Please submit curriculum vitae, a letter describing teaching and research interests, official transcripts, and names, addresses, and telephone numbers of three professional references to:
Office of Human Resources
Bridgewater State College
Bridgewater, MA 02325.

Review of applications will begin on January 2, 1998, and continue until the position is filled. Bridgewater State College is an equal opportunity employer which actively seeks to increase the diversity of its workforce.

In their viewpoint, the popular TV shows of the 1950’s, such as “Ozzie and Harriet” or “Leave It to Beaver,” represent the ideal family. In actuality only a small number of families have ever fit this description. Today many people romanticize that period and fantasize a return to the “good old days.” While the nostalgia may elicit a warm feeling, the reality of family life in the 1950’s was far removed from that depicted by movies and TV programs. During that period, both men and women were forced into restrictive, stultifying roles which led many to seek solace and escape in the consumption of legal drugs such as alcohol and tranquilizers. Furthermore, physical, sexual and emotional abuse of women and children although hidden from public view were as much a problem then as they are today.

The widely accepted concept of the ideal family is in actuality an amalgam of structures, values and behaviors that never co-existed in the same time and place. We have taken bits and pieces of many periods and blended them into an unrealistic idea of family, and we have fallen into the trap of seeing a cause and effect relationship where none exists. In addition, we are frequently guilty of using the “chicken little” approach in defining a family by assuming that life would be better if only “other people or their children” had the right kind of upbringing—meaning of course values and behaviors present in our own family. Yet, in the words of the author, “despite all the difficulty of making generalizations about past families, the historical evidence does suggest that families have been most successful whenever they have built meaningful, solid networks and commitments beyond their own boundaries.”

While the author occasionally drifts too far toward the side of sermonizing, overall the book is well-researched and well-written. Prior to reading the book, my concept of family, like that of many others, had been based primarily upon my own experiences. The author broadened my understanding of family in all its permutations.

The Phantom Reviewer

HAPS-EDucator February 1998 page 13
HAPS ANNUAL TALENT SEARCH!

If you are searching for a new direction in your career, HAPS has a place just for you. Complete this form and mail it today to join other members on the HAPS ADVENTURE. Be sure to include a resume, a brief statement of approximately 200 words describing your interests or goals concerning HAPS and a photograph (2” X 3”). Another way you can be involved with HAPS is to help us find undiscovered talents. If there is a HAPS member you think would make a terrific officer or a committee member, please consider nominating that person for a position in the organization.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institution</th>
<th>Department</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Postal code</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone</th>
<th>Fax</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For what elected office would you be willing to serve as a nominee? (Check one or more.)
President-Elect (3 yr. term)___ Secretary (2 yr. term)___
Treasurer (2 yr. term)___ Regional Director (2 yr. term)___

In what appointed position would you consider serving? (Check one or more.)
Archivist___ Editor___
Committee Chair (Please indicate.)__________________________

On what committee would you be willing to serve? (Check one or more.)
Animal Use Committee___
Annual Conference Committee___
Competency Testing Committee___
Core Curriculum and Assessment Committee___
Grants and Scholarships Committee___
Local Conference Committee___
Membership Committee___
Nominating Committee___
Technology Committee___

Would you be willing to coordinate a regional or national HAPS conference?
When__________________________ Where__________________________

Nominations:
I,__________________________________________, am nominating the HAPS member listed above for a leadership position. My phone number is:__________________________________________

Are there so many options that you can’t decide which one to select? Maybe you would like to know the duties and responsibilities of a given position before you sign up. Or perhaps you are concerned that it will take too much time away from your already busy life. To help with these or other questions, contact:

Steven Trautwein, President-Elect
Southeast Missouri State University
Biology Department
One University Plaza
Cape Girardeau, MO 63701-4799
Phone: (573) 651-2362
Email: c338s@semovm.semo.edu
Using Multimedia in Your Classroom Teaching

Submitted by
Jamie King
Craven Community College
New Bern, NC 28562
jking@csc.craven.cc.nc.us

The human brain processes, interprets and integrates information in uniquely different ways that vary significantly from person to person. It is also structured along functional axes such that some areas respond only to visual input whereas others respond only to verbal stimuli and so forth. Recently it has been demonstrated that for a significant number of students learning occurs more readily if the material is presented visually as compared to verbally. This is not a new idea for educators who have long understood the value of graphic presentation of concepts. Remember the “opaque projector?” The “overhead projector?” “Filmstrips?” This visual presentation of concepts is what multimedia is all about. Today we use computers and LCD projectors instead of the sometimes cumbersome or awkward methods we once used. The biggest difference between the modern and the older visual technologies is that with multimedia educators have the ability to develop their own visual presentations using slideshow-type software.

Students are constantly immersed in Hollywood glitz, MTV music videos and fast-paced television commercials. For better or for worse, the moment you put a multimedia presentation on the screen in your classroom, students will compare it to these highly polished productions. The surprise comes when you realize, after a few attempts, that you are coming out on top in that comparison! Your students are not dummies. They can recognize glitz and hype for what they are—just empty entertainment. They will also recognize a presentation that effectively uses visual and sound imagery to help them do the job they have determined to do, which is to learn!

There are three major challenges in developing multimedia presentations that are tailored specifically to the needs of your students. The first challenge is in understanding what your technology can and cannot do. The second is in choosing the right tools for the right job. The third and most important challenge is using those tools for effective communication. One of the best ways to determine the effectiveness of a multimedia presentation is to carefully evaluate student comments and assessments. After all, they are the consumers of your multimedia product. Students have indicated that they value multimedia presentations because such an approach:

- makes classes more interesting, exciting and even entertaining;
- helps organize the class material;
- helps them understand the material better and enhance learning;
- makes the presentation clearer, neater and more colorful;
- aids in note-taking;
- helps them stay focused on the subject;
- assists visual learners, which is almost everyone;
- provides a more flexible, versatile and efficient way of learning;
- reinforces and supports textbook material, as opposed to simply repeating it;
- demonstrates that professors are keeping up with technology.

Through the use of multimedia, our classroom presentations become more organized which appears to be one of its most positive benefits. (Does this suggest perhaps that teachers tend to be a bit disorganized unless constrained by a structured presentation?) Multimedia presentations are a huge advance over hastily scribbled notes on a blackboard or overhead projector. But multimedia classroom presentations are not, and should not be, an end in themselves. We must keep in mind that computer-aided multimedia presentations are just one of several methods that are useful in helping our students learn and master the material. Students can easily differentiate between “need-to-know” material versus “nice-to-know” material. Without a firm foundation in normal anatomy and normal physiology, for example, it is impossible to understand abnormalities and disease processes. Stu-
udents are intuitively aware of this, and it provides intrinsic motivation. Once we move away from text slides with bullet points to illustrate important ideas and move toward presentations that incorporate images, sounds and animation, we provide an environment where students are the ultimate beneficiaries.

There are many "canned" multimedia presentations that are available on the market, and publishers may offer them as an inducement to use their texts. A few of these are quite good, others are minimally acceptable and some are terrible. These presentations may create problems with your students because they:

- guide students to a predetermined goal that is not an important learning goal in your course or curriculum.
- use terms and concepts that students don't know thereby requiring that you spend class time explaining them.
- speed over important points and concepts.
- include special effects that although they provide "glitz" may actually distract students from learning the important points.

One of the biggest difficulties with in-house development of classroom multimedia presentations is that the average faculty member needs large blocks of time to develop them. Not only does the faculty member need to re-design a given lecture but also learn how to use a new tool. This does not happen instantaneously. My own experience suggests that it takes about 15 hours of development time to produce a multimedia presentation used in one hour. Faculty often object to being pressured to use multimedia in teaching for many reasons, but the time needed to develop presentations is certainly an important factor. The most effective way to approach this task is to take it just one step at a time or "poco a' poco," as the Spanish would say. No one that I know has become an expert in multimedia instruction overnight.

Students sympathize with your lack of expertise and respond positively to even the smallest steps you take. Recently at my institution, we undertook a study to determine student responses to multimedia teaching, and the results were immensely positive, even in classes where the instructor was just starting out and using only a few small pieces of multimedia in a mostly-traditional course. Don't let the time com-

---

Developing Your Multimedia Presentation in Four Easy Steps

*Step one:* Pick one point or one concept to build into the presentation. This should be something that normally takes you about one lecture period or less. The most common mistake is to try to include too much, rather than too little!

*Step two:* Organize your thoughts by laying out a script outline for the presentation, including graphics. This will take the largest part of your time. You end up with a series of "screens" (whatever is projected on the wall at any one time is called a screen), each with some combination of text, graphics, images, color and motion or sound.

*Step three:* Locate resources. These are images, graphics, video clips, sounds and so forth that you will need to finalize your script. Slides, computer disks, CD-ROMs, laserdiscs, books, magazines, live video, video tape, the internet or diagrams that you develop or draw yourself are all good resources. Get the resources into a form that you can use, for example, a scanned image, video input card or whatever. This can be frustrating sometimes because while you may know what you want to use, the necessary equipment may not be available in your department or institution. Don't give up, patience and fortitude will win out in the end!

Once you have the necessary information in the computer, you may find that the images, graphics or text could be improved by a little judicious editing. If this is not within your area of expertise, you can usually find somebody on campus who will help. Check around.

*Step four:* Put it all together! Use your script outline and your resources to compose your presentation. Try out your presentation on yourself first. Run the whole presentation for an audience of one (YOU), just exactly as if you were giving it before a lecture hall full of students. You will probably catch a few errors, or you may notice something that needs to be added, some little flaw that needs fixing. Go fix it. Then do it again! In effect, try it on yourself one more time. After you have done this a half-dozen times or so, both you and the presentation will be ready for a public presentation. Take it to the classroom, and do not be surprised if your students applaud at the end!

To complete the cycle there is actually a step five to the process. To begin step five, go back to step one, pick a new idea and begin developing it. Keep going until it, too, is ready to use. Then start another. Keep this cycle going until you run out of ideas. Then begin refining and upgrading the presentations. It never really ends.
# Do's and Don’t’s for a Dynamic Multimedia Presentation

## Things to Do

- Do show a hierarchy of points and sub-points.
- Do include sound, animation, pictures and diagrams.
- Do include humor.
- Do use special effects, but in moderation.
- Do use a large image or screen.
- Do lecture expressively in conjunction with slides.
- Do add enough color contrast.

## Things to NOT Do

- Don’t put too much information on one screen.
- Don’t use text letters that are not large enough.
- Don’t use an illegible text font.
- Don’t use too many special effects.
- Don’t move too quickly from slide to slide.
- Don’t read each bullet point or label.
- Don’t stand in front of the screen.
- Don’t sit at the computer when lecturing.

mitment monster scare you either, just carve it up a little at a time.

Another point worth noting is that learning is improved if you give students notes or handouts prior to their viewing the multimedia presentation. With notes dependably in hand, the students are better able to focus on the presentation. They miss fewer points and ask more detailed and thoughtful questions when they are able to think in class instead of trying to be an expert in shorthand.

How does one get started with in-house development of multimedia presentations?

1. Get familiar with what your presentation software can do. Don’t worry about completely mastering it before you go on. You’ll improve as you go along.

2. Use a current classroom activity so that the details are fresh in your mind. First, find a concept or point that you think could be presented visually in a better way than you are now doing it. The next step is to lay out a detailed script, sometimes called a "storyboard" in the multimedia business. Decide on the images you want and in what order, include the text, speech and sounds that should accompany those images.

3. Locate image resources to support your script, and if necessary digitize them. A.D.A.M.* is a primary resource for human anatomy. Slides or flat images can be scanned and incorporated into your presentation, as can images downloaded from internet sources or your own art work.

4. Finally, using your script or storyboard and your images, start building your presentation one screen at a time. As you work, you will probably change your storyboard many times. For example, you may have written text over a certain image, but now you think it would work better to have that text "march" in from the side after the image is in place. Just keep the learning goal in mind and stay close enough to your script so that you don’t wander off and confuse the students.

That’s it! Multimedia is neither too difficult nor too complicated. A multimedia presentation developed in-house is focused on a specific learning objective. It is chosen, developed and amplified by the instructor to meet his/her overall course goals. It works and works well so try it in your
classes. I know you will like the results as will your students.

USING A.D.A.M.® IN MULTIMEDIA TEACHING PRESENTATIONS

What is A.D.A.M.®? First off, I guess I had better tell you what it is not. A.D.A.M.® is not a ready-to-run CD-ROM that you can put into a classroom computer, start it up and then stand there and watch it perform (like a video or a movie). If that is what it is not, then what is it? In a word, it is a resource. In my opinion, there simply is not another available source of anatomy images that is even close to A.D.A.M.®. It provides the necessary resources to build a high-quality anatomically accurate multimedia presentation for the classroom or laboratory.

One of the strongest advantages to using A.D.A.M.® is that it can do almost anything that you can imagine. Of course you have to first come up with the idea and then use A.D.A.M.® to develop it. The only thing that A.D.A.M.® can do by itself is to display human anatomy in exacting detail with fantastic clarity. With the new A.D.A.M.® Interactive Anatomy (AIA) and its Slideshow capability, you can clip anatomical graphics, add text to a slide and create a whole presentation in surprisingly little time.

Since many nursing procedures require a knowledge of human anatomy, A.D.A.M.® is useful in dramatizing the underlying anatomical basis for these procedures. Students are more inclined to follow procedures or adhere to standard guidelines when they understand what positive outcomes may occur and why. (Note: we prefer not to practice negative outcome procedures on real people!)

In summary, multimedia presentations are an excellent learning tool. They take time to develop, but they are not beyond the capabilities of most teachers. The presentations that are developed in-house, such as with A.D.A.M.® authoring software, are usually better-suited to our students and our classes than the canned versions. Remember the advice of Nancy Reagan: "Just do it!"

References:

Syllabus98
The premier conference covering the use of technology in the curriculum

July 25-31, 1998
Sonoma State University
Rohnert Park, California

Conference Content Areas

- The Internet and Teaching
- Education Futures and Technology
- Instructional Technology Support Track
- Distance Learning Paradigms
- Collaboration
- Case Studies
- Assessment and Evaluation of Educational Technologies
- Pre- and Post-Conference Workshops

For additional information, visit the Syllabus98 website at:
http://www.syllabus.com
or email: Syll98@syllabus.com
HAPS COMMITTEES AND BOARDS

Have you wondered where you could obtain a standardized anatomy and physiology test? Or maybe you are thinking about an educational project and are looking for funding? Do you feel strongly about a particular issue and would appreciate an opportunity to discuss it with other HAPS members? The following committee chairs invite input from HAPS members and willingly provide information on the activities of their committees.

ANIMAL USE COMMITTEE
Pip Merrick, Co-Chair
University of North Carolina
CB #3280/Coker Hall
Chapel Hill, NC 27599
Phone: (919) 732-1070

Craig Clifford, Co-Chair
Northeastern State University
611 N. Grand Avenue
Tahlequah, OK 74464
Email: clifford@cherokee.nsuok.edu
Phone: (918) 456-5511 X 3827
Fax: (918) 458-2325

A three-year plan includes widely distributing the HAPS policy statement, developing animal use internet links on the HAPS Home Page, addressing laboratory safety issues, monitoring relevant legislation, developing a dialogue with specimen suppliers and creating a resource packet for HAPS members. Suggestions and questions from members are welcome.

COMPETENCY TESTING COMMITTEE
John Dustman, Chair
Indiana University N.W. Department of Biology
3400 Broadway Gary, IN 46408
Email: j dustman@iunmail.iun.indiana.edu
Phone: (219) 980-7106

This committee recently completed and tested an approved HAPS Standardized Test for Human Anatomy and Physiology. Any HAPS member may obtain a copy of the test by writing to the Chair.

CORE CURRICULUM AND ASSESSMENT COMMITTEE
Ronald Carlin, Chair
Fairleigh Dickinson University
285 Madison Ave.
Madison, NJ 07940
Phone: (201) 593-8748

This committee has developed a second, revised edition of the HAPS "Human Anatomy and Physiology Course Guidelines." The second edition includes new guidelines relating specifically to the laboratory component of the course.

EDITORIAL ADVISORY BOARD
Colleen Nolan, Interim Chair
St. Mary's University
One Camino Santa Maria
San Antonio, TX 78228
Email: bionolan@smtparytx.edu
Phone: (210) 436-3241
Fax: (210) 431-6746

Members of the Editorial Advisory Board provide advisory and support services to the HAPS Editor such as writing articles and proofreading the final draft of the HAPS-EDucator before it goes to press.

GRANTS AND SCHOLARSHIPS COMMITTEE
Estrella Ang, Chair of Review Subcomm.
University of Pittsburgh at Greensburg
1150 Mt. Pleasant Road
Greensburg, PA 15601
Email: esree@vms.cis.pitt.edu
Phone: (412) 836-9693
Fax: (412) 836-7129

The Grants and Scholarships Committee is responsible for reviewing all grant and scholarship proposals, selecting proposals to receive funding, and submitting its recommendations to the Board of Directors for approval. Completed grant and scholarship applications are due December 31, 1997.

MEMBERSHIP COMMITTEE
Connie Vinton-Schoepske, Chair
Hawkeye Community College
Department of Arts and Sciences
P.O. BOX 8015
Waterloo, IA 50704
Email: mssa@forbin.com
Phone: (319) 296-2874

Committee members assist the Chair with recruiting members and compiling membership information.

NOMINATING COMMITTEE
Steven Trautwein
Southeast Missouri State University
One University Place
Cape Girardeau, MO 63701-4799
Email: c338seb@semovm.semo.edu
Phone: (573) 651-2362
Fax: (573) 651-2322

The committee chair is always the current President-Elect. The responsibility of the committee is to recruit nominees for the elected offices and appointed positions of the HAPS organization.

LOCAL CONFERENCE COMMITTEE
Ann Smith, Chair
Joliet Junior College
1216 Humbolt Rd.
Joliet, IL 60436
Phone: (815) 729-9020 X2373
Fax: (815) 773-6670

The committee provides mentoring assistance to coordinators of local conferences. Anyone interested in hosting a local conference should contact the Chair.

ANNUAL CONFERENCE COMMITTEE
Shirley Mulcahy, Chair
San Diego Mesa College
Biology Department
7250 Mesa College Drive
San Diego, CA 92111
Email: smulcahy@intergate.sdmesa.dcccd.ca.us
Phone: (619) 627-2787 Fax: (619) 297-5668

Development of a standardized fees structure for the annual conference, formulation of guidelines and assistance for the conference coordinator and generation of a calendar of conference sites are the primary responsibilities of the committee.

TECHNOLOGY COMMITTEE
Martha DePecol Sanner, Co-Chair
Middlesex Community-Technical College
100 Training Hill Road
Middletown, CT 06457
Email: MDSSANNER@aol.com
Phone: (860) 343-5780

John Waters, Co-Chair (Internet-related Issues)
208 Mueller Laboratory
Department of Biology
Penn State University
University Park, PA 16802-5301
814-863-1154
JRW8@psu.edu

The committee monitors and reports on technological changes influencing anatomy and physiology teaching such as advances in instructional software and data acquisition equipment.

HAPS-EDucator February 1998 page 19
Human Anatomy & Physiology Society
222 South Meramec, Suite 303
St. Louis, MO 63105

Address Service Requested

EXHIBITORS
1997 HAPS ANNUAL CONFERENCE
TORONTO, CANADA

The Human Anatomy and Physiology Society wishes to express its appreciation for the support provided by these exhibitors:

A.O.A.M. Software Inc.
1600 River Ridge Pkwy. Suite 800
Atlanta, GA 30328
(770) 986-0888

American Physiological Society
9650 Rockville Pike
Bethesda, MD 20814-3991
(301) 571-0672

Biomedical Models
P.O. BOX 620
Ramsay, NJ 07446
(800) 635-4801

Harcourt Brace & Co. Canada
55 Horner Ave.
Toronto, ON Canada M8Z 4X6
(416) 285-4491

Intellisool Inc.
P.O. BOX 459
8 N River St.
Batavia, IL 60510
(800) 227-3805

Mosby Publishing
11830 Westline Industrial Drive
St. Louis, MO 63146
(314) 453-4678

Page Two
56 Temperance St. Suite 300
Toronto, ON Canada M5H 3V5
(416) 214-1342

Prentice Hall
1 Lake St.
Upper Saddle River, NJ 07458
(201) 236-7283

S & S Company of Georgia
827 Pine Ave.
P.O. BOX 45
Albany, GA 31702-0045
(912) 435-8394

Visible Productions/Micro Biosystems
116 North College Ave. Suite 7
Fort Collins, CO 80524
(970) 467-7240

Zahourek Systems, Inc.
2138 West 154th St.
Loveland, CO 80538-3597
(970) 667-9047

Addison Wesley Longman
(Benjamin/Cummins)
2725 Sand Hill Road
Menlo Park, CA 94025
(415) 854-0000

Biopac Systems, Inc.
42 Aero Camino
Santa Barbara, CA 93117
(805) 685-0066

Candent
21-2601 Matheson Blvd. E.
Mississauga, ON Canada L4W 5A8
(905) 629-7688

Centre for Image Processing in
Education
P.O. BOX 13750
Tucson, AZ 85752-3750
(520) 322-0118

Denoyer-Geppert Science Co.
5225 Ravenswood Ave.
Chicago, IL 60640-2928
(773) 561-9200

DCM/Instructional Systems
P.O. BOX 96
Westwood, MA 02090
(508) 660-0700

Jones & Bartlett Publishers
40 Tall Pine Dr.
Sudbury, MA 01776
(508) 443-5000

MacLab/PowerLab-Division of AD
Instruments Inc.
P.O. BOX 845
115 Cedar St. Suite N4
Milford, MA 01757
(800) 234-1757

McCraw Hill Ryerson
300 Water St.
Whitby, ON Canada L1N 9B6
(905) 430-5128

Medical Plastics Laboratory Inc.
P.O. BOX 38
Gatesville, TX 76528-0038
(817) 865-7221

Neoteck
1239 Bellerock
Pittsburgh, PA 15217
(412) 521-1111

Porsco
5026 E. Townsend Ave.
Fresno, CA 93727
(559) 252-2144

The Ohio State University
4072 Graves Hall
333 W. 10th Ave.
Columbus, OH 43210
(614) 292-5318

Virtual Anatomy
159 W. Broadway
Salt Lake City, UT 84101
(801) 534-7945

WCB/McGraw-Hill
1221 Ave. of America
New York, NY 10020
(212) 512-2692